REMARKS

Claims 1-20 have been amended in this Response to Office Action. Claims 21 and 22 have been added and no claims have been cancelled. Thus, claims 1-22 are currently pending. In addition, the Specification and Abstract have been amended as described below. No new matter has been introduced.

I. Amendments to the Specification

The Specification has been amended to insert Section Headings, remove translator's notes, make reference numbers consistent with those in the drawings and correct errors due to the translation of the Specification from German into English.

It is respectfully requested that these amendments be entered.

II. Amendments to the Abstract

The Abstract has been amended to remove the reference numbers.

It is respectfully requested that these amendments be entered.

III. Amendments to the Claims

In addition to the amendments described below, the claims have been amended to make them more consistent with US claim standards.

It is respectfully requested that these amendments be entered.

III. Objections to Claims 2-4 and 7-18

The Examiner has objected to claims 2-4 due to the reference numbers included in these claims. Claim 1-20 have been amended to remove all reference numbers.

The Examiner has objected to claims 7-18 as being in improper form because a multiple dependent claim cannot depend from a multiple dependent claim. The claims have been amended to remove all multiple dependencies. The amendments are summarized below.

Claim 4 has been amended to depend only from claim 2.

Claim 5 has been amended to depend only from claim 2.

Claim 8 has been amended to depend only from claim 1.

Claim 9 has been amended to depend only from claim 1.

Claim 11 has been amended to depend only from claim 1.

Claim 14 has been amended to depend only from claim 11.

Claim 15 has been amended to depend only from claim 11.

Claim 16 has been amended to depend only from claim 11.

Claim 17 has been amended to depend only from claim 1.

Claim 18 has been amended to depend only from claim 1.

Where necessary, the claims have been amended to provide proper antecedent basis for the claim limitations.

It is therefore respectfully requested that these objections be withdrawn.

IV. Rejection of Claims 1-6, 19 and 20 under 35 USC § 112, Second Paragraph

The Examiner has rejected claims 1-6, 19 and 20 under 35 USC § 112, second paragraph, as being indefinite.

With regard to claim 1 (and dependent claims 2 and 3), the Examiner has rejected this claim as including the broad recitation of a range/limit "means for the influencing of the transmission ratio" and the narrower recitation of a range/limit "in particular for the influencing of the circulation flow." Claim 1 has been amended to remove the narrower recitation. The narrower recitation has been included in new claim 21 that depends from claim 1.

With regard to claim 6, the Examiner has rejected this claim as including the broad recitation of a range/limit "uneven" and the narrower recitation of a range/limit "in particular curved." Claim 6 has been amended to remove the narrower recitation. The narrower recitation has been included in new claim 22 that depends from claim 6.

With regard to claims 4-6, the Examiner has rejected these claims as providing insufficient antecedent basis for the limitations "the front sides" and "the front sides." Claim 4 has been amended to replace "the front sides" with "front side." Claim 5 has been amended to depend from claim 2 and to replace "the front side" with "a front side." As claim 6 depends from claim 5, "a front side" as recited in claim 5 provides the antecedent basis for "the front side" recited in claim 6.

With regard to claims 19-20, the Examiner has rejected these claims as reciting a "Procedure for the influencing" that appears to be a method claim, but does not include any method steps. Claim 19 has been amended to recite the following steps "providing the hydrodynamic clutch with a primary and a secondary impeller which together form a working chamber; and providing the hydrodynamic clutch with at least an element..." Thus, claim 19 (and claim 20 that depends from claim 19) recites method steps.

It is therefore respectfully requested that the rejection of these claims be withdrawn.

V. Rejection of Claims 1-6 under 35 USC § 102(b)

The Examiner has rejected claims 1-6 under 35 USC § 102(b) as anticipated by German Patent Application No. DE 1196438 to Eta Corporation GmbH. The English translation of this reference will be referred to as "Eta" in this Response. A copy of the English translation is enclosed for the Examiner's convenience. It is respectfully submitted that claims 1-6 are not anticipated by Eta because Eta does not teach all the limitations of claims 1-6. In particular, Eta does not teach an "element which forms an interference or baffle region which extends at least partly into the working chamber" (*emphasis added*).

> "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently, in a single prior art reference." *MPEP* § 2131 (citing *Verdegual Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987)).

Eta teaches multiple embodiments of a regulatable hydrodynamic clutch. (*Eta*, title; Figs. 1-5). The hydrodynamic clutch (*Eta*, Figs. 1-5) described in Eta includes a turbine wheel T or housing wall, a pump wheel P, an axial mobile wall 3, 12 or 16 and a working chamber bounded by the walls of the turbine T and pump P wheels and the axial mobile wall 3, 12 or 16. (*Eta*, col. 1, lns. 1-18; col. 3, lns. Figs. 1, 4 and 5). The axially movable wall 3, 12 or 16 is formed as unit with an axially adjustable ring slide ("suitable intermediate elements"). (*Eta*, col. 1, lns. 18-20; col. 3, lns. 12-33; Figs. 1 and 4).

The Examiner has asserted that elements 3, 12 and 16 in Eta each teach the "element which forms an interference or baffle region which extends at least partly into the working chamber" as recited in claims 1-6 of the Application. However, in Eta, the working chamber is bound, in other words defined, in part by the axial mobile wall 3, 12 or 16. Because the wall 3, 12 or 16 is used to define the working chamber, moving the wall 3, 12 or 16 simply changes the size and shape of the working chamber. Thus, the wall 3, 12 or 16 is not and cannot "extend at least partly into the working chamber."

Therefore, it is respectfully requested that the rejection be withdrawn.

VI. Claims 7-22

Claims 7-20, which were not addressed on the merits in the Office Action, and new claims 21-22 are not anticipated under § 102(b) by Eta. Claims 7-22 include the limitation of an "element which forms the interference or baffle region element which extends at least partly into the working chamber." Eta does not teach this limitation for the reasons set forth above.

Therefore, it is respectfully requested that claims 7-22 be allowed.

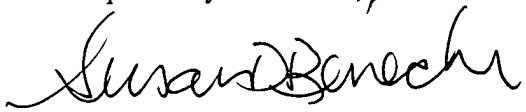
CONCLUSIONS

It is respectfully submitted that pending claims 1-22 are in condition for allowance, and such allowance is hereby requested.

It is believed that fees for a three (3) month extension of time (large entity) ($1,050.00) and two (2) additional independent claims ($100.00) are due in connection with the filing of this Response to Office Action. If payment of this and/or any additional fees is not otherwise provided for in this Response, please charge the fees to Deposit Account No. 09-0007.

If any questions should arise, please do not hesitate to contact the undersigned.

Respectfully submitted,



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GERMAN PATENT OFFICE

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PATENT APPLICATION 1196438

Number: 1196438

File number: E13337 XII/47c
Date of application: 7. December 1956
Date of examination: 8 July 1965

Regulatable hydrodynamic clutch

Applicant:

Eta Corporation GmbH,
Hamburg-Othmarschen, Roosens Park 9

The invention concerns a regulatable hydrodynamic clutch with an axially adjustable ring slide located between the turbine wheel or housing wall extending axially to the pump wheel in its peripheral area on the one hand, and a pump wheel projecting past the turbine wheel or housing wall on the other, whereby the part of the wall projecting past the pump wheel is the guiding wall for the clutch fluid. The task of the invention is to make a rapid emptying or rotational speed regulation possible in such clutches, e.g. by reducing the circulating working material, with materials which are primarily a component of the pump or turbine wheel. This invention is solved in that the working chamber bounded by the walls of the turbine and pump wheels is next to a fluid holding chamber on the pump wheel side, whereby the working chamber is separated from the fluid holding chamber by an axially mobile wall which is formed as the guiding wall for the working fluid and forms a unit with the ring slide, and whereby the fluid holding chamber next to the work chamber is bounded by the extension outwards of the turbine wheel or housing wall. In this manner, by freeing the flow path, for instance in the centrifugal direction, a rapid emptying and/or rotational speed regulation can be rendered possible with little technical effort.

The chamber, through which fluid flows in the regulation or throttle position and which is bounded by the extension of the turbine wheel wall, can be bladed to support the aforementioned process. The blades in the chamber formed by the turbine wheel wall extension can hereby be arranged opposite the direction of working rotation of the turbine wheel, so that unnecessary rotational movement of the parts struck is avoided.

The outer turbine wheel wall extension can be formed as a cylindrical guide, as is conventional in axially sliding wall parts in hydrodynamic clutches, etc.

It is most practical if the conventional axially sliding wall parts have stretched or primarily straight and/or flat surfaces, so that largely resistance-free flow can occur. The axial carrier or pushing element for the axially mobile wall part is preferably formed as a mesh or rod, so that e.g. during axial sliding of the wall part in the direction of the turbine wheel, the flow strikes the sliding wall part on its back or front side.

Another embodiment specifies that the pump blade parts arranged radially outwards from the axially sliding wall part are connected to the inner pump blade parts with blade bars which are turned towards with the turbine wheel, and that the inner surface of the axially sliding wall part is equipped with gaps which in the throttle position can surround the blade bars between the inner and outer blade parts from three sides. The axially sliding wall part can hereby be fixed against rotation and be a mechanical brake against the turbine wheel or its wall-like extension, and it is also possible to form the axially sliding regulation element either fixed against rotation or rotating along, as desired.

The intake openings to the working circulation can be located in the axially sliding wall part, or intake openings can be formed from the axially sliding wall part and its neighboring wall part. It is practical for intake openings to be arranged, as conventionally done, in the suction area of the pump wheel leading to its pressure side.

In order to prevent the undesired development of heat, the invention describes an advantageous embodiment which equips the rotating parts of the turbine wheel with cooling surfaces, e.g. in the form of plate-like radial ribs or the like.

In Fig.1 through Fig 5, an example embodiment of the invention is shown.

Fig. 1 shows a hydrodynamic clutch in which the peripheral outer turbine wheel wall projects axially and cylindrically over the pump wheel.

Fig. 2 shows the arrangement of turbine blade parts in the chamber forms by the turbine wheel wall part projecting over the pump wheel, while

Fig. 3 includes the chamber of the pump blades covered by the turbine wheel wall part;

Fig. 4 shows the formation of the extended turbine wheel wall as a guiding surface or bounding surface for a side chamber;

Fig. 5 shows the external wall surrounding the turbine and pump wheels as a guiding wall or forming a side chamber.

In Fig. 1 through 5 the pump wheel is denoted with a *P* and the turbine wheel with a *T*. M_1 is always the drive shaft and M_2 is the output shaft.

1 denotes the cylindrically extended turbine wheel outer wall, which projects over the pump wheel 2; the cylindrical turbine wheel extension 1 hereby forms the axial guide for the fixed or corotating wall part 3, which can be provided at 4 or 5 with intake openings for the working circulation.

The wall part 3 leads outwards using suitable intermediate elements and can be axially moved to the gate 6, or be held fixed. The pump and turbine wheels are surrounded by a shared clutch housing 7.

In Fig. 2, the turbine blade part, which projects into the chamber formed above the pump wheel by the turbine wheel outer wall, is denoted by 8. The pump blade parts in the same chamber are denoted in Fig. 3 by 8,whereby the blade bars 10 connect the outer parts 9 with the inner pump blade parts 11.

In Fig. 4, the outer upper pump wheel wall is shown as a flattened wall part 12, which through an axial slide to the motor side effects a flow against the extended turbine wheel outer wall and/or the side chamber 13 formed by it. 14 denotes a blading of the chamber 13.

At *A-B* there is a cross-section indicated of the conventional mesh-like or rod-like formation of the slide elements for the wall part 12 or 16.

In Fig. 5, the clutch housing 15 is shown as the guide wall for the axial slide 16, whereby the guide wall can be the boundary of the side chamber 17.

Patent claims:

1. Regulatable hydrodynamic clutch with an axially adjustable ring slide located between the turbine wheel or housing wall extending axially to the pump wheel in its peripheral area on the one hand, and a pump wheel projecting past the turbine wheel or housing wall on the other, whereby the part of the wall projecting past the pump wheel is the guiding wall for the clutch fluid, characterized by the fact that the working chamber bounded by the turbine and pump wheel walls is next to a fluid side chamber on the pump wheel side, whereby the working chamber is separated from the fluid holding chamber by an axially movable wall (3, 12, 16) which is formed as a guide wall for the working fluid and forms a unit with the ring slide, and whereby the fluid holding chamber after the working chamber is bounded on the outside by the extension of the turbine wheel or housing wall.

2. Clutch according to Claim 1, characterized by the fact that the chamber (13) through which fluid flows in regulation or throttle position and which is formed by the continuation of the turbine wheel wall, is bladed (14).

3. Clutch according to Claim 2, characterized by the fact that the blading (14) in the chamber (13) formed by the continuation of the turbine wheel wall is opposite the operational rotation of the turbine wheel (*T*).

4. Clutch according to one of Claims 1 through 3, characterized by the fact that the direction of flow in the chamber (13) formed by the turbine wheel wall continuation and/or within the clutch housing (15) is different from that of the turbine wheel (*T*).

5. Clutch according to one of Claims 1 through 4, characterized by the fact that the external turbine wheel wall continuation is a cylindrical guide (1) of a conventional axially sliding wall part (3), whose exhaust flow direction in the regulation or throttle position points towards the side chamber.

6. Clutch according to one of Claims 1 through 5, characterized by the fact that a conventional axially sliding wall part (12) has stretched or primarily flat surfaces.

7. Clutch according to one of Claims 1 through 6, characterized by the fact that the axial carrier or the sliding element (*A-B*) for the axially sliding wall part (e.g. 12) is formed as a mesh or rod, so that e.g. during axial sliding of the wall part towards the turbine wheel the mobile wall part is impacted by the flow on its back and/or front side.

8. Clutch according to one of Claims 1 through 7, characterized by the fact that the pump blade parts (9) arranged radially outwards from the axially sliding wall part are connected to the inner pump blade parts (11) with blade bars (1) which are opposite the turbine wheel (*T*), and that the inner surface of the axially sliding wall part has gaps which, in the throttle position, can surround the blade bars between the inner and outer blade part from three sides.

9. Clutch according to one of Claims 1 through 8, characterized by the fact that the axially sliding wall part (3 or 12) is rotationally fixed and is a mechanical brake against the turbine wheel or its wall-like extension (e.g. 1).

10. Clutch according to one of Claims 1 through 9, characterized by the fact that the axially sliding regulation element and/or the axially sliding wall part (3, 12, 16) is rotationally fixed or corotating, as desired.

11. Clutch according to one of Claims 1 through 10, characterized by the fact that in the axially sliding wall part (e.g. 3) intake openings (4) to the working circulation are arranged, or that between the axially sliding wall part and its neighboring wall parts, intake openings (5) to the working circulation are arranged or are formed.

12. Clutch according to one of Claims 1 through 11, characterized by the fact that in the suction area of the pump wheel (*P*), conventional inflow openings are arranged leading to its pressure side.

13. Clutch according to one of Claims 1 through 12, characterized by the fact that the rotating parts of the turbine wheel are equipped with cooling surfaces, e.g. plate-like radial ribs or the like.

Publications considered:
German patents no. 469 005, 581 185;
Austrian patent no. 84 718;
French patent no. 1 120 358;
British patent no. 519 968;
US patents no. 2 156 040, 2 392 520, 2 420 071.

1 sheet of drawings attached

German Cl.: 45c-14
Date of examination: 8 July 1965

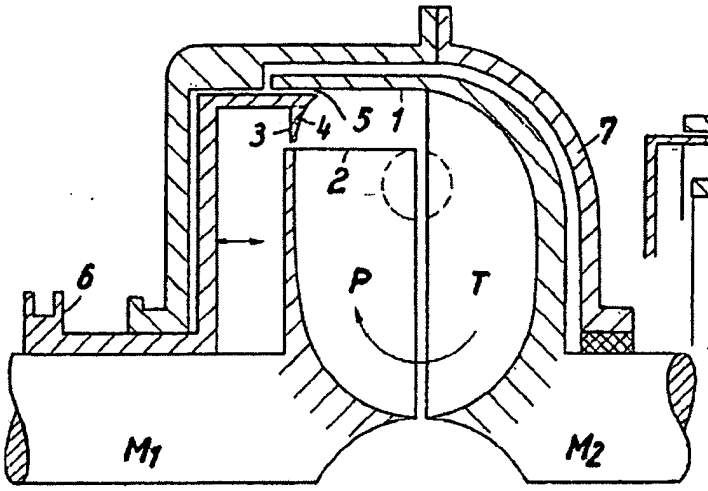

Fig. 1

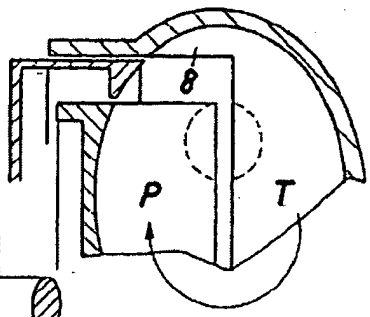

Fig. 2

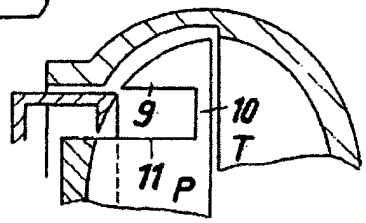

Fig. 3

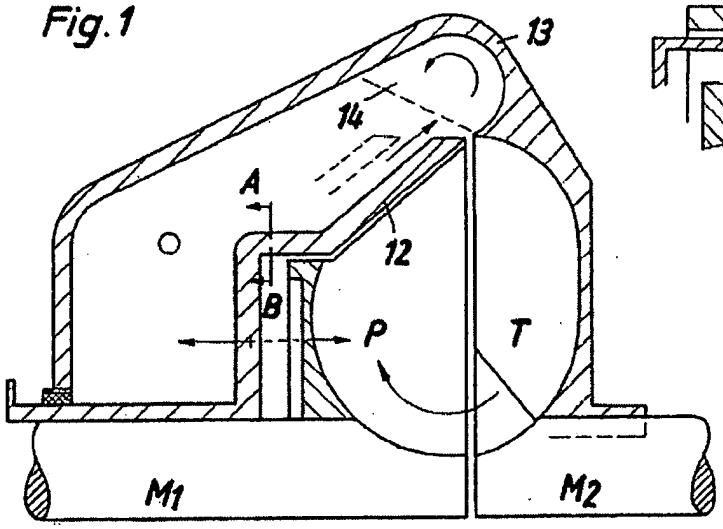

Fig. 4

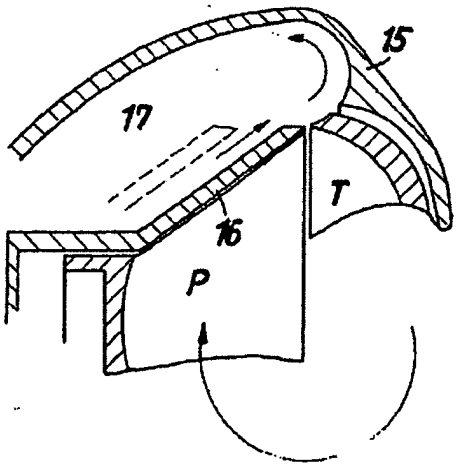

Fig. 5

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